# Improving Medication Management Practices and Care Transitions Through Technology

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**Organization:** Visiting Nurse Service of New York
**Mechanism:** RFA: HS08-002: Ambulatory Safety and Quality Program: Improving Management of Individuals With Complex Healthcare Needs Through Health Information Technology (MCP)
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**Project Period:** September 2008 – September 2012
**AHRQ Funding Amount:** $1,199,998

**Summary:** The overall aims of this project were to examine the relative effectiveness and cost-effectiveness of a health information technology (IT) intervention designed to facilitate high-quality care transitions to home health care. The project developed a medication management system intended to improve clinician practice and enhance patient engagements by identifying patients with complex medication regimens, providing clinical decision support (CDS) for clinicians, and providing supplementary information to patients.

The intervention tested an automated algorithm to identify high-risk patients and send an email alert to the home health nurse shortly after the patient's admission to home care. It also provided the nurse with medication decisionmaking support, including high-risk medication management recommendations that were integrated into the clinician's visit documentation system and the patient's electronic health record. The nurses of eligible patients were randomized to a usual care group or an intervention group on a rolling basis at a 2-to-1 ratio. Once randomized, the study arm assignment did not change, and all eligible patients of a particular nurse were included in the same study arm as the nurse's randomization assignment. A sub-sample of eligible patients whose nurses were randomized into the study was recruited to complete in-home surveys that provided additional information on process of care and outcomes.

The health IT system was evaluated by comparing the intervention arm to the usual care group. This project was an extension of the existing Visiting Nurse Service of New York (VNSNY) health IT system and had many of the features that the home health nurses use regularly.

**Specific Aims:**

- Examine the relative effect of the intervention on workflow and medication management practices of home health care nurses. **(Achieved)**
- Examine the relative effect of the intervention on the outcomes and service use of patients in the respective intervention groups. **(Achieved)**
- Estimate the costs associated with the intervention and subsequent care and compare these costs relative to usual care. **(Achieved)**

**2012 Activities:** Study enrollment and implementation of the intervention began in February 2010 and concluded in 2011. In 2012, the analysis team focused on obtaining secondary data, data cleaning, and

data analysis. The analysis looked at whether the intervention: 1) changed the complexity score of the medication regimen; 2) reduced the number of hospitalizations; and 3) reduced the number of emergency room (ER) visits.

Due to changes in staffing and the complexity of the analyses, the team used a 1-year no-cost extension to complete the data analyses. As last self-reported in the AHRQ Research Reporting System, project progress was completely on track and budget spending was on target. This project ended in September 2012.

**Impact and Findings:** Five hundred nurses were enrolled in the study. Of these, 165 (33 percent) were randomized to the intervention arm. A total of 7,919 patients were included in the study, with 2,550 (32 percent) in the intervention arm. The primary analyses did not find reductions in the medication complexity score, hospitalizations, or ER visits.

A survey administered to a subset of 826 participants did not identify improvements in the process of care, patient knowledge of medications, or patient medication management. However, within the intervention group, nurses' use of CDS was associated with significantly more patients moving below the medication complexity risk threshold and significantly lower patient hospitalization rates. The most frequent documented actions of nurses using the CDS were nurses advising the patient to keep his/her medication list up-to-date and to bring the list to his/her doctors' appointments. Far fewer records indicated that the nurse advised the patient to speak with the doctor about simplifying his/her medication regimen, and only a small number of records indicated that the nurse reached out to the doctor directly to work on simplification.

Dr. Feldman hypothesizes that observed variations in CDS use likely were due in part to variations in the nurses' level of comfort with the different care management practices embedded in the CDS tool or with variations in their comfort with the IT system itself. Support for this hypothesis is provided by the nurse characteristics that were predictive of CDS use among nurses in the intervention group. Nurses with more experience at the VNSNY and those who were in salaried staff positions (versus per diem nurses) were more likely to use the tool at least once. Furthermore, the more patients a nurse had in the study, the more likely the nurse was to use the CDS tool.

Several patient characteristics also predicted CDS use by the nurse. The CDS was more likely to be used the longer patients were in home care service and the more nurse visits they had. This may have been because the nurse had more opportunity to use the tool or it may have been a result of using the tool. Nurses used the tool more often with patients who took a greater number of medications. While all patients for whom the nurses received an alert had complex medication regimens, it is possible that nurses were more concerned about patient risk when the number of medications taken was higher.

This study provides new information on the predictors of CDS use and the impact of CDS use on patient outcomes. Strategies to increase use of CDS tools need further exploration in order to provide greater benefit to more patients.

**Target Population:** Adults, Chronic Care*, Elderly*

**Strategic Goal:** Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

**Business Goal:** Implementation and Use

** This target population is one of AHRQ's priority populations.*